

UNIFIED WATERSHED ASSESSMENT

STATE OF NEW HAMPSHIRE

Prepared by

**New Hampshire
Department of Environmental Services**



Incooperation with the

USDA, Natural Resources Conservation Service



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1. Background

The Clean Water Action Plan (CWAP) was released on February 14, 1998 by federal agencies at the direction of the President. The CWAP charts a course toward fulfilling the original goal of the Clean Water Act -- “fishable and swimmable” waters for all Americans. Among the many specific actions called for by the CWAP is one for states to develop “Unified Watershed Assessments” that identify watersheds that do not meet clean water and other natural resource goals and where preventive action is needed to sustain water quality and aquatic resources.

There are four categories in the Unified Watershed Assessment:

- Category I **Watersheds in Need of Restoration.** These watersheds do not now meet, or face imminent threat of not meeting, clean water and other natural resource goals.
- Category II **Watersheds Meeting Goals, Including Those Needing Action to Sustain Water Quality.** These watersheds meet clean water and other natural resource goals and standards and support healthy aquatic systems. All such watersheds need the continuing implementation of base clean water and natural resource programs to maintain water quality and conserve natural resources.
- Category III **Watersheds with Pristine or Sensitive Aquatic System Conditions on Lands Administered by Federal, State, and Tribal Governments.** States and tribes work cooperatively with federal land managers to identify watersheds with exceptionally pristine water quality, drinking water sources, or other sensitive aquatic system conditions, which are located on lands administered by federal, state, or tribal governments.
- Category IV **Watersheds with Insufficient Data to Make an Assessment.** These watersheds lack data, critical data elements, or the data density needed to make a reasonable assessment.

Categories are assigned to each 8-digit Hydrologic Unit Code watershed (as delineated by the U.S. Geological Survey), for which there are twelve in New Hampshire.

2. Methodology for the New Hampshire Unified Watershed Assessment

To develop New Hampshire's Unified Watershed Assessment, existing information was compiled primarily from the Clean Water Act Section 303(d) list (impaired or potentially impaired waters), the Source Water Protection Program, and the DES Biology Bureau data bases. In order to aggregate the data up to the larger 8-digit HUC scale, priority ratings were given to each data base entry, as follows:

Drinking Water Issues:

If drinking water standard is violated for non-transient systems	High
If drinking water standard is violated for transient systems	Medium

Other Watershed Issues:

If restoration work is already in progress, e.g. construction of advanced wastewater treatment works	Low
If investigative work is already in progress, or re-sampling is needed to validate the existence of a problem	Medium
If investigative work is needed to resolve a public health issue	High
If work is needed to restore a use or uses demanded by the public	High
If a TMDL is needed, or if implementation of a TMDL is needed	High

Based on the aggregated prioritized data (see Appendix 1), the Coastal and Lower Merrimack watersheds have the highest concentrations of water quality problems (see Figure 2).

The New Hampshire DES worked collaboratively with the USDA, Natural Resources Conservation Service and the NH Association of Conservation Districts to develop a process for obtaining public input with the Unified Watershed Assessment.

Public review and input was received at a series of meetings co-sponsored by the ten County Conservation Districts during the month of August 1998. Generally, the public agreed that our data reflect a greater need for restoration in the southeastern part of the state, however, many commenters suggested that our existing data collection programs are biased toward population centers. For example, more water quality complaints are generated in more populated areas, resulting in more DES water quality investigations in southeastern New Hampshire. Another limitation of our existing data is that ambient sampling occurs during summer low flow conditions primarily as a check on our wastewater treatment facilities. Several commenters pointed out that agricultural and forestry impacts, as well as impacts from new development, were

not reflected in the draft Unified Watershed Assessment.

Additional information provided in the New Hampshire Resource Protection Project, the Silvio O. Conte National Fish and Wildlife Refuge Action Plan, and the NH-VT Joint Rivers Commission Connecticut River Management Plan identified other critical areas with biological resources under imminent threat from various sources.

A summary of written comments submitted during the public comment period is given in Table 1.

Table 1
Summary of Public Comments on the Draft Unified Watershed Assessment

Water body	Category	Reason
Lamprey River	Category I	Bringing the Epping Waste Water Treatment plant into compliance. Pay special attention to the Wiswall Dam impoundment - need to include this segment in database and review water quality data from VRAP.
Black River and Powow River	Category IV or possibly Category I or Category II	Insufficient data exists in NH. Once reviewing the Massachusetts data information may trigger drinking water issues or it may be found that the surface water quality standards for the Amesbury drinking water supply are not met.
Powwow River	Category II	Increase in weed growth - some of the shallower areas are almost impassable. This particular sub-watershed has not been sufficiently studied to determine the extent of any problems that may exist. Amesbury, MA applied for an EPA grant in 1996 to study this watershed. Check status of that grant.
Lake Sunapee	Category II	Water quality degradation at deep sites where oxygen levels are non existent in late summer. Mount Sunapee's recent leasing causes anticipated influx of new development which could greatly impact the water quality in area streams and lakes.
Chocorua Lake	Category I	Data suggest severe water quality decline. Also there is a problem with run off, erosion, and sediment mobilization along Route 16.

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Water body	Category	Reason
The Lakes Region - Winnepesaukee	Category II	Need public education, impact of recreational use/increased use of lakes for recreation, lack of enforcement for existing water quality protection, tourism and population growth/planning, inappropriate shoreline development -poorly planned, constructed and managed, consistency between towns, and carrying capacity
Lake Winnepesaukee	Category I	City of Laconia - Storm water discharges (also affecting Lake Winnisquam,Winnepesaukee River, Lake Opechee, and Paugus Bay), Weirs Beach - erosion, Paugus Bay - boating impacts on water quality.
Lake Winnepesaukee	Category I	Current work being done in Paugus Bay , Lake Opechee, and the Winnepesauke River with the goal of implementing measures to address these impacts. The Winnepesaukee watershed is critical to NH because of its size, beauty and overall impact on the Lakes Region.
Lake Winnisquam, Opechee, Winnepesaukee and Winnepesaukee River	Category I	High E-coli counts, excessive levels of PAH and VOCs, stormwater discharge, solid waste fill and eroding shorefront, underwater dumpsite, sand and sand storage on Lake Opechee, urban runoff, filling and contaminated runoff, bank erosion, sediment deposition, marinas lacking adequate loading ramps and cleaning stations, sediment disruption due to heavy motorized boat traffic and speeds, erosion causing sedimentation into critical wetland, individual on-site septic system concentrations, diesel fuel, oil and creosote discharges from railroad operations, and eel mutilation and decomposition due to inadequate passage facilities and management practices at Lakeport Dam.

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Water body	Category	Reason
Jewett Brook, Durkee Brook, Black Brook (Winnepesaukee Watershed)	?	Need to limit boat traffic and provide portable toilets. Much debris found in these brooks and too much build up on adjacent properties.
Moultonboro Bay	Category I	Highly threatened due to the high ratio of shoreline to volume of water causing inadequate flushing, and plant life is encroaching. Use data from Lakes Lay Monitoring Program to make recommendations. More intense data gathering and dissemination of results.
Paugus Bay	?	Increased number of boats - gray water pumped from boat's bilge introduces gas and oil and other unknown contaminants. Suggest a study of the capacity of Paugus Bay. Also increased development along the shores affects water quality. Black Brook in Gilford discharges into Paugus Bay just above intake. Parking lots and roadways also runoff into the Bay.
Lake Winnepesaukee - Weirs Beach area	?	Erosion, economic impacts of beach getting smaller, state should take responsibility for causing damage in an area as a result of preventing damage in another area, storm water and winter runoff, (high levels of sand and salt).
Coos County	Category I	Areas in watershed have already been identified as problems and whatever happens in Coos County is compounded many times as water moves through the state and into the ocean, because they are at the top of the watersheds.

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Connecticut River Basin (Haverhill Tributaries, Oliverian Brook, Hanover-Piermont, Littleton Tributaries, Ammonoosic River)	Category I	<p>Agricultural land use causing negative impacts - non-point source pollution, hydrologic conditions associated with high susceptibility to contamination i.e., stratified drift aquifers, low income population cannot afford pollution control measures to sustain watershed health.</p> <p>Action items needed: reduce nutrient over-enrichment, restore riparian areas and conservation buffers, ensure safe drinking water, assure health of rural children, and improve monitoring and assessment. Strong partnerships are already in place to restore watersheds.</p>
all shorelands	?	<p>Building permit applicants for lots fronting on great ponds should be required to submit photos of the lot before construction begins to document current status. Property owners should be issued information sheet explaining provisions of the Shoreland Protection Act. Building inspector should provide photo and copy of permit to Conservation Commission for review.</p>
Merrimack River and Lower Pemigewasset	Category I	Streambank erosion
Merrimack and Suncook Rivers	Category I	stormwater runoff from Concord, Franklin, and Pittsfield

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Connecticut River (Lancaster to Dalton)	Category I	Bank erosion and nonpoint source runoff threaten the largest known, and northernmost population of the federally-listed (threatened) dwarf wedgemussel.
Ashuelot River	Category I	The downstream-most dam on the Ashuelot blocks anadromous fish passage and impairs water quality on the lower River. The river is potential habitat for anadromous fish, including Atlantic salmon. Additionally, the River has a population of dwarf wedgemussel whose dispersal relies, in part, on the presence of host fish species that are likely excluded from the river by dams and associated water quality impairments.
Souhegan River	Category I	The downstream-most dam (Merrimack Village Dam) prevents access by river herring and American shad to 10 miles of habitat.
Atlantic Coast, Piscataqua River, Great Bay/ Little Bay Estuary	Category I	<p>Seven dams on the Exeter River, Lamprey River, Taylor River, Winnecut River, Oyster River and Cocheco River require new or rehabilitated fishways to provide access to tens of miles of significant spawning habitat for American shad and river herring.</p> <p>There are approximately 50 locations totaling more than 1300 acres of degraded saltmarsh due to tidal flow restrictions.</p>

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Water body	Category	Reason
Soucook River	Category I	<p>Cold water fishery, one of three native brook trout fisheries in the State, is in need of restoration. Fishery impacted by growth in the 1980s and gravel mining along the banks of the Soucook River, which has removed shade trees, increasing water temperature. Sand from gravel bank erosion has been deposited in the river, covering former gravel spawning beds. Gravel mining has resulted in wetlands fills, eliminating storage capacity during runoff events which has resulted in lower base flows in the River, eliminating deep pools whose colder waters are necessary for Brook Trout survival during summer months.</p> <p>NH Fish and Game scheduled to complete chemical, biological, physical, and habitat analysis of the Soucook River in summer 1999. Preliminary engineering study will be needed to recommend restoration strategies.</p>

3. Recommendations for Watershed Categorization and Restoration Priorities

Category I watersheds do not now meet, or face imminent threat of not meeting, clean water and other natural resource goals. Our preliminary analysis, based on available water quality data, showed that the Coastal (1080003) and Merrimack (1070002) watersheds had the highest concentrations of water quality problems. Many additional comments regarding specific water quality problems were offered by the public. These comments confirmed the assessment of the Coastal and Merrimack watersheds as being in need of restoration, and also provided information supporting additional Category I designations.

In some cases, the 8-digit Hydrologic Unit Code watershed included smaller sub-watersheds in need of restoration. These smaller areas were delineated by 11-digit Hydrologic Unit Codes.

There was general agreement at public meetings that watersheds not designated Category I or III should be included in Category II to emphasize the importance of preventative action in healthy watersheds.

The category designations under the New Hampshire Unified Watershed Assessment are presented in Table 2.

Table 2
Unified Watershed Assessment
Watersheds by Category

Category	Watershed	HUC Code	Reason
I	Piscataqua/Salmon Falls	01060003	numerous water quality standards violations, shellfish bed restoration
	Merrimack	01070002	numerous water quality standards violations
	Haverhill Tributaries	01080104-010	Imminent threat from agricultural operations
	Oliverian Brook	01080104-020	Imminent threat from agricultural operations
	Hanover-Piermont	01080104-060	Imminent threat from agricultural operations
	Littleton Tributaries	01080104-230	Imminent threat from agricultural operations
	Ammonoosuc River	01080101-250	Imminent threat from agricultural operations
	Cornish-Plainfield Tributaries	01080104-090	habitat restoration needed for rare, threatened, or endangered species (Jessup's Milk Vetch, tiger beetle, dwarf wedge mussel)
	Charlestown Tributaries	01080104-130	habitat restoration needed for rare, threatened, or endangered species (Jessup's Milk Vetch, tiger beetle, dwarf wedge mussel)
II	Bearcamp River (Chocorua Lake portion)	01060002-110	Water quality impairment in Chocorua Lake due to Route 16 runoff.
	Upper Androscoggin	01040001	pollution prevention
	Upper Connecticut	01080101	pollution prevention
	Lower Androscoggin	01040002	pollution prevention

Category	Watershed	HUC Code	Reason
	Saco	01060002	pollution prevention
	Pemigewasset	01070001	pollution prevention
	Upper Connecticut-Mascoma	01080104	pollution prevention
	Middle Connecticut	01080201	pollution prevention
	Miller	01080202	pollution prevention
	Nashua	01070004	pollution prevention
III	Peabody River	01040001-120	White Mountain National Forest
	Wild River	01040002-020	White Mountain National Forest
	Upper Saco River	01060002-010	White Mountain National Forest
	Swift River	01060002-020	White Mountain National Forest
	Cold River	01060002-040	White Mountain National Forest
	East Branch Pemi River	01070001-010	White Mountain National Forest
	Upper Pemigewasset River	01070001-020	White Mountain National Forest
	Middle Pemigewasset River	01070001-030	White Mountain National Forest
	Mad River	01070001-040	White Mountain National Forest
	Wild Ammonoosuc River	01080101-270	White Mountain National Forest

Restoration Priorities for watersheds for which Watershed Restoration Action Strategies will be developed and implemented were selected using the established priority system (H,M,L) and public comments. The watersheds identified in Table 3 are scheduled for work during the next two fiscal years (99-00) and are limited by the expected amount of new funds available (\$700,000/yr).

Table 3
Watershed Restoration Priorities

Category I Watershed	Restoration Needed
Coastal Basin	Shellfish beds
Merrimack Basin	Urban stormwater runoff and streambank erosion
Merrimack Basin	Lake Winnepesaukee--address imminent threat from development and recreational activity
	Moultonborough Bay--phosphorus reduction
Connecticut Basin: Haverhill Tribs (01080104-010) Oliverian Brook (01080104-020) Hanover-Piermont (01080104-060) Littleton Tributaries (01080101-230) Ammonoosuc River (01080101-250)	Agricultural runoff
Merrimack Basin	Pond restoration -- Baboosic Lake
Merrimack Basin--Soucook River	Restoration of Cold Water Fisheries
Saco Basin--Chocorua Lake	Eliminate or reduce runoff pollution from Route 16 corridor

Restoration of these water bodies is a long term process expected to continue beyond the next two fiscal years. Our long term strategy for watershed restoration will involve developing more local partnerships to continue working in the watersheds listed above while monitoring water quality impacts in other watersheds to determine future restoration needs. Local input is critical to the watershed restoration action strategies that will be developed in high priority watersheds.

Appendix 1

Unified Watershed Assessment Database